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## NATIONAL VETERINARY MEDICAL ASSOCIATION

### PRESIDENT'S NEW YEAR MESSAGE TO MEMBERS

### *To All Members of the National Veterinary Medical Association*

IT is my privilege as President of the National Veterinary Medical Association of Great Britain and Ireland to express through the columns of *The Veterinary Record* Seasonal Greetings to all of you at the commencement of the New Year. That it is indeed a privilege there is no doubt. It enables the President—as an individual—to renew the bond of friendship with many more than he could otherwise reach, and it helps him to forge a link of fellowship between all members of the Association—no matter where they be.

At the start of this year, 1945, fraught with such immense potentialities, it is my desire to depart somewhat from custom by assuming on your behalf a responsibility in addition to my privilege.

May I, however, firstly, extend the sincerest good wishes of my wife and myself to the Office-bearers, Councilmen and Members of the N.V.M.A.—to each and every one personally, and to the members of their families. It is our earnest hope that 1945 may bring you health, happiness and prosperity, both individually and collectively.

I feel sure it will not be regarded as invidious if I do myself the honour of singling out some for especial remembrance at this time. Those members and their relations serving in the many branches of the armed Forces deserve, above all, our kindest thoughts. It may, we hope, lighten by some small measure the burdens they carry on our behalf, frozen or scorched in war's varying wilderness of ice or jungle, bog or desert, sea, sky or prison camp, to know that we remember them and to be assured that for them we cherish a heartfelt hope that 1945 will bring an end to the present conflict, and for some at least a return to the paths of peace.

To other members of the profession serving overseas—in Dominion or Colony, in foreign country or on the high seas—we would also express a wish, none the less sincere because of the distance that divides or the time that separates the writing from the reading, a wish that for them too, 1945 may bring a full measure of happiness and satisfaction in work well done, no matter what the local hardship or difficulty.

I am confident I shall not be misunderstood if I add a special wish for all good things to those who have just passed or are yet upon the threshold of entrance to the profession—the new graduates and the students. The young members of the profession, and the students of to-day, have great and impressive vistas of work and service opening up before them. In shouldering the tasks and responsibilities of to-morrow, far greater than those of yesterday, they will need the sympathy and encouragement of all of us. That they will be equal to their tasks we are assured: another has said that the safest of risks is to give youth a full trick at the helm.

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It is perhaps no great crime for a President to be purely parochial; nevertheless, it is my earnest desire that, perhaps most especially this year, even the risk of my being so accused shall be avoided.

I would like to extend Greetings and Good Wishes, on behalf of the whole Association, to all members of the veterinary profession belonging to the nations of our Allies.

Some have been with us in these islands during most of the past five years. Many we have come to know and now number among our friends. We can appreciate their outlook as we value their opinion, and we hope they have learnt to know us and our points of view. Some have only come more recently and perhaps have not had time or opportunity to understand us, or we them.

Many others, however, have had no such contacts. Among these, specially should we remember those who have suffered and those who are suffering still in the enemy-occupied countries. There are no monopolies in hardship or suffering, and much as we ourselves may have had to withstand, it is but little alongside the experiences of all too many in the over-run territories. I feel confident that I am voicing the sincere wishes of all members of the N.V.M.A. in expressing the hope that before another New Year dawns the veterinarians of our Allies in Europe will all be engaged in the tasks of reconstruction freed from the grim shadows of war. We wish for those still under German oppression a speedy release and, for all, courage to help them to re-establish their services in their respective countries.

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It is customary at this time to turn our eyes to the New Year and to try to pierce the shadows ahead. What are the prospects for 1945? What changes are envisaged?

Sometimes a quick review of the past may establish a perspective for the future. The year now closed has been momentous. Certain items of particular professional importance command attention. The Interdepartmental Committee on Veterinary Education in Great Britain issued its second report in April; the magnitude of the interest in veterinary education awakened throughout the whole profession and the eloquence of the discussions, augur well for the future of this vital basis of our structure. Whatever ultimate decisions and arrangements are reached it is impossible to believe that much progress will not be made. The P.D.S.A. Bill was launched, was fought and was defeated, and it is to be hoped that one consequence may be a better mutual understanding between the profession and all the Animal Welfare Societies. The Minister of Agriculture and the Secretary of State for Scotland, in July, appointed a Committee to enquire into the extent and effect of unqualified practice and make recommendations. The Committee, under Sir John Chancellor's chairmanship, has begun its deliberations and is collecting evidence. Its report will be eagerly awaited. The reconstruction of the Local Veterinary Inspectorate of the Animal Health Division, promised many months ago, has been announced and is now in progress. It is confidently hoped that this measure will do much to relieve some of the pressure of work attending general veterinary practice. Almost simultaneously the nation-wide calf vaccination scheme against contagious abortion has been launched, and additionally a uniform system of inspection of all milk-producing herds has been initiated. These are each far-reaching measures, and though they will need time to achieve full momentum, it is to be anticipated that they will confer great benefits upon producer and consumer alike.

It is not too much to claim that the profession is annually reaching to fuller stature, at a rate which has seldom been equalled and never surpassed in its past century of endeavour. Yet there is much to do. Perhaps one of the greatest remaining tasks is so to conduct our affairs corporately and personally, that the general public not less than the agricultural public and those charged with Administration realise fully the great value to the country of a modern, well-trained, scientific veterinary profession, and are prepared to award it that degree of recognition, and encourage it to assume that measure of responsibility, without which it can never contribute fully to the permanent well-being of the nation. There will doubtless be occasions during the coming year when opportunities will arise for many of us to contribute towards raising the status of the profession; let us register a vow that we will seize these opportunities and turn them to best advantage during 1945, and in the years that lie ahead.

May I conclude with the time-honoured wish: *A Very Happy New Year to Everyone of You.*

W. L. C. Miller

*January 6th*, 1945. *President.*

# Sulphonamides in Veterinary Practice*

*by*

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The literature regarding the sulphonamides is now extensive and in introducing a discussion on the subject two options present themselves: one, to deal in some detail with a particular aspect or their use in particular diseases; the other to consider the subject in a more general way with emphasis on fundamental matters. I have chosen the latter because it opens a wide field for discussion and because a proper appreciation of the fundamentals remains of outstanding importance if the best is to be got from these drugs and they are not to be wasted. A brief review will be added of the various reports dealing with the use of sulphonamides in diseases of animals, references to this section of the paper being given for those who wish to read further.

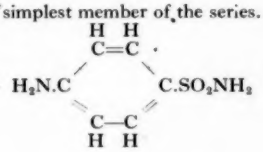
## Historical

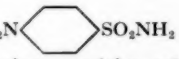
The first publication to attract wide interest was that of Domagk (1935), who stated that administration by the mouth of small doses of Prontosil protected mice against otherwise fatal streptococcus infections, controlled or cured streptococcus infections in rabbits and had some effect on staphylococcus infections in rabbits. The next noteworthy step was a paper by the Trefouels, Nitti and Bovet (1935), who attributed the action of Prontosil to its breakdown in the body to para-amino-benzene-sulphonamide (sulphanilamide), a relatively simple compound which was subsequently shown to be effective. Several papers appeared in the course of the next year, outstanding amongst which were those by Colebrook and Kenny (1936) regarding the action of Prontosil in puerperal fever in women, and by Buttle, Gray and Stephenson (1936), who confirmed the action of sulphanilamide on streptococcus infections and showed that it was active in meningococcal infections in mice, but not staphylococcus or certain pneumococcus infections, and also synthesised other sulphonamides. The next notable advance was the finding by Ewins that by insertion of the pyridine radical, a compound, sulphapyridine, was produced which was fully effective against pneumococcus infections, Whitby (1938). Following this lead large series of compounds have been synthesised of which some have properties of particular value, and have come into common use.

## Sulphonamides in Common Use

Sulphanilamide is the simplest member of the series and all others contain this grouping. Acetylation of the sulphamido-group produces sulphacetamide, substitution with the pyridine, thiazole, pyrimidine, dimethyl pyrimidine and guanidine radicals produces sulphapyridine, sulphathiazole, sulphadiazine, sulphamezathine, and sulphaguanidine respectively, whilst the introduction of a further succinyl-group into sulphathiazole yields succinyl-sulphathiazole. These compounds are represented graphically below, together with 4-4′ diamino diphenyl sulphone, to show the way in which they have been evolved.

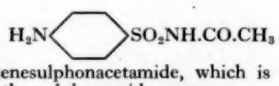
*Sulphanilamide*—the simplest member of the series.



or more simply 

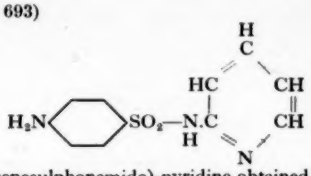
*i.e.*, p. aminobenzenesulphonamide

*Sulphacetamide*



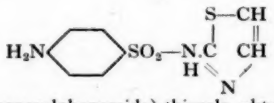
*i.e.*, p. aminobenzenesulphonacetamide, which is obtained by acetylation of the sulphonamido group.

*Sulphapyridine* (M & B 693)



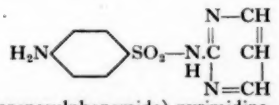
*i.e.*, 2(p. aminobenzenesulphonamido)-pyridine, obtained by substitution of one H of the sulphonamido group with the pyridine radical.

*Sulphathiazole*



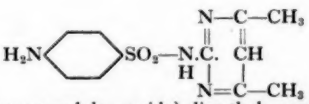
*i.e.*, 2(p. aminobenzenesulphonamido)-thiazole, obtained by substitution with the thiazole radical.

*Sulphadiazine*



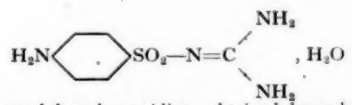
*i.e.*, 2(p. aminobenzenesulphonamido)-pyrimidine, obtained by substitution with the pyrimidine radical.

*Sulphamezathine*



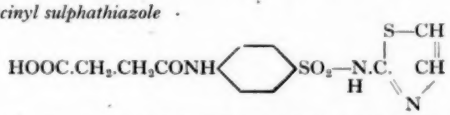
*i.e.*, 2(p. aminobenzenesulphonamido)-dimethyl pyrimidine, obtained by substitution with the dimethylpyrimidine radical.

*Sulphaguanidine*



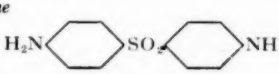
*i.e.*, p. aminobenzenesulphonyl-guanidine, obtained by substituting the guanidine radical for the whole amido group.

*Succinyl sulphathiazole*



*i.e.*, 2(p. succinyl-aminobenzenesulphonamido)-thiazole, obtained by the additional substitution of a succinyl group for an H atom in the amino part of the molecule.

*Diamino diphenyl sulphone*



## Method and Range of Action

The action of the sulphonamides is bacteriostatic rather than bactericidal. They inhibit the growth of susceptible organisms and so allow the body defences time to act. It is believed that they do this by interfering with, or blocking, one of the essential enzyme-systems of the bacteria which normally uses the closely similar para-aminobenzoic acid for its growth. They have, however, to be in high concentration because the bacteria prefer their natural substrate, the *p*-aminobenzoic acid. In fact, the presence of excessive amounts of this substance has been shown by experiment to reduce or inhibit completely the antibacterial activity of the sulphonamides.

Substances which reduce the activity of the sulphonamides are also present in certain peptones (important in the initial laboratory tests of a drug) and in pus, necrotic tissue and inflammatory effusions, a fact which explains their reduced clinical activity in the presence of such materials. Their activity is also liable to be reduced by local anaesthetics of the procaine type and in fact anything containing the *p*-aminobenzoic acid group.

The range of action of the sulphonamides varies, *e.g.*, sulphanilamide is effective against streptococci but not staphylococci,

* Paper presented to the Yorkshire Division, N.V.M.A., at Leeds, April 28th, 1944.

pneumococci or pasteurella; sulphapyridine and sulphamezathine are effective against streptococci, pneumococci and pasteurella, but not staphylococci; whilst sulphathiazole and sulphadiazine are effective against all four organisms. This difference is in the main quantitative, *e.g.*, sulphapyridine, as well as having a wider range, is more active against streptococci than sulphanilamide. These differences in activity are due amongst other things to the far higher dissociation of the more active compounds in the body. For the same reason sulphonamides are more active in an alkaline environment. There is some evidence, however, that qualitative differences also exist. If this is due to attack on another essential growth factor it clearly widens the field and increases the hope that new compounds of wider range and greater activity may be produced, *e.g.*, for the acid-fast bacteria or the swine erysipelas organism.

The probable range and activity of any given sulphonamide can be predicted with considerable confidence from tests carried out in the laboratory *in vitro* or, when the infection can be set up experimentally, better still in small laboratory animals or birds. By both methods a controlled series of tests can be carried out on a scale impossible with the larger animals or in human beings, and sufficient to give answers not likely to be due to chance. *In vitro* results have always to be confirmed *in vivo* and experiments in small laboratory animals repeated in the larger animals, but the rapid progress in the sulphonamide field provides a striking example of the value of the combination of intensive laboratory work and prompt clinical trial.

The information regarding the range of activity of the sulphonamides against organisms of veterinary importance is yet far from complete, but the following is already available. Any organism which is susceptible to sulphanilamide may be expected to be attacked by the others.

*The streptococci* as a whole are susceptible to sulphanilamide. The group C. streptococci, *i.e.*, those found in most equine infections and in some cases of bovine mastitis, in joint-ill in lambs and in certain infections in most species, are particularly susceptible. The group G. streptococci frequent in canine infections are also susceptible, whilst the group B. streptococci, *Str. agalactiae*, of bovine mastitis are less susceptible.

*The staphylococci* are only susceptible to sulphathiazole or sulphadiazine.

*The pasteurella* are not susceptible to sulphanilamide but are to sulphapyridine and similarly active compounds.

*C. pyogenes* is not susceptible to sulphanilamide but is to some extent to sulphapyridine and more to sulphathiazole.

*Coccidia* of certain species are susceptible to sulphaguanidine or sulphamezathine.

*E. rhusiopathiae, Br. abortus* and *the acid-fasts* are susceptible to none.

In some cases the knowledge that a given disease organism is susceptible has come directly from clinical trials. These have shown, *e.g.*, that *Fusiformis necrophorus* must be susceptible to sulphapyridine and moderately to sulphanilamide. *Rickettsia canis* to sulphapyridine, and *Bact. suipestifer* to sulphaguanidine and similarly active compounds; whilst recent work (Asplin, 1944) has shown that the virus of neurolymphomatosis (fowl paralysis) in chickens is susceptible to all the more active sulphonamides. An interesting point, moreover, is that they presumably act in the same way as on the visible microorganisms, because their action can be inhibited by *p*-aminobenzoic acid.

## Development of Resistant Variants

One of the reasons for insisting on adequate dosage is the now well established fact that when organisms are exposed to low and ineffective concentrations of sulphonamides, they learn to grow in the new environment and may eventually become resistant to a given drug even in high concentration. They may also become resistant to other more potent sulphonamides.

This possibility is one to be guarded against, not only for the sake of the individual under treatment, but because, since the enhanced resistance is maintained for at least several generations and the resistant strains may be transferred to other animals, inadequate treatment on an extended scale might lead to a considerable proportion of animals being infected with resistant strains. In general, sulphonamide resistant strains are not more resistant to other bacteriostatic or bactericidal agents, *e.g.*, the acridine dyes, to propamidine or penicillin.

## Pharmacology

Apart from differences in degree and range of activity the sulphonamides differ in other ways, *e.g.*, their solubility, rate of absorption and excretion and the likelihood of toxic symptoms.

*Sulphanilamide.*—When administered by the mouth sulphanilamide is rapidly absorbed into the blood stream whence it is distributed more or less evenly to other tissues and fluids except fat. In animals with a simple stomach given an initial therapeutic dose of, say, 1 gramme per 10 lb. body weight, a peak concentration of about 15 mgs. per cent. is reached within a few hours, the concentration being halved in about 12 hours and very low at 24 hours, when most has been excreted *via* the urine. With a smaller dose both peak and maintenance are poorer; with higher dosage better. In ruminants absorption is a little slower and more irregular, but blood concentrations are maintained longer. The peak concentration in milk is a little lower than that of blood and occurs later but maintenance is for obvious reasons better. It seems to matter little whether animals are fasted or not, but absorption is a little retarded by administration in capsules and considerably by molasses.

*Sulphathiazole* behaves much as sulphanilamide but absorption and excretion are a little quicker and the necessity of dosage at sufficiently short intervals is therefore greater.

*Sulphapyridine* is absorbed somewhat more slowly and less regularly or completely.

*Sulphadiazine* is very slowly excreted and produces relatively high and well maintained blood concentrations.

*Sulphaguanidine* behaves rather differently: much is unabsorbed with the result that high concentrations are attained in the large intestine before final excretion in the faeces. This has accounted enteritis and coccidiosis. *Sulphamezathine* is more rapidly absorbed than sulphanilamide and more slowly excreted.

*Succinyl-sulphathiazole* is absorbed very little. High intestinal concentrations can therefore be obtained without coincident high blood concentrations and the attendant dangers. It has the added advantage of containing the very active thiazole radical. It is therefore replacing sulphaguanidine.

After absorption, part of the sulphonamide becomes acetylated to form acetyl sulphanilamide, acetyl sulphapyridine and so on with the other drugs. These acetyl derivatives are not only inactive but less soluble than the original drugs and during excretion tend to crystallise out in the kidneys. Hence the necessity for an ample water intake. Sulphanilamide and sulphapyridine are more readily acetylated than sulphathiazole or sulphadiazine. The degree of acetylation varies also in different species and more information is needed regarding the domesticated animals.

## Dosage

There is considerable variation in the rate of absorption in different individuals even when conditions of feeding are alike and whilst it is of the utmost importance that dosage should be adequate, sight should not be lost of the danger of toxic effects. Ideally, therefore, as is possible in hospital practice, estimations should be made of the blood (or intestinal) concentrations reached and the dosage and interval kept at the minimum necessary to maintain an adequate level. This cannot be done in general practice and an average scheme of dosage has to be used, with a watchful eye for toxic symptoms.

With all sulphonamides an initial large dose should be given in order to raise the blood concentration quickly. In general, this should be followed by the same dose daily, divided into at least two 12-hourly doses for ruminants and three 8-hourly doses for other animals, beginning 12 hours and eight respectively after the initial dose.

With *sulphanilamide* an initial and daily maintenance dose of about 1 gramme per 10 lb. body weight has been found generally satisfactory. Sulphanilamide should not be given to fowls.

With *sulphapyridine* an initial and daily dose of 1 gramme per 20 lb. is usually regarded as sufficient, though doses up to 1 gramme per 15 lb. have frequently been used. This gives blood concentrations of about 6 to 8 mgms. per cent.

According to some authors the maintenance doses should be decreased by about one-third every two days since toxic effects may otherwise develop.

With *sulphathiazole* initial and daily doses of 1 gramme per 20 lb. are sufficient. With this dosage the blood concentrations may be expected to be about 2 to 4 mgms. per cent. or a little higher, but observations are few. Double the dosage has been used in dogs and cats without untoward effects. The daily maintenance dose should be divided into rather more doses given at shorter intervals owing to the rapid excretion of this drug.

*Sulphadiazine* has been used in calves and small animals in doses similar to those of sulphapyridine and sulphathiazole—1 gramme per 15 to 20 lb. body weight. Dosage can be less frequent owing to its slower rate of excretion. This slow rate of excretion results in blood concentrations becoming relatively high and sight should not be lost of the possibility of attendant toxic symptoms.

With *sulphaguanidine* initial and daily dosage have varied from 1 gramme per 20 lb. to 1 gramme per 5 lb. One gramme per 10 lb. gives ample concentrations of several hundred mgms. per cent. in the faeces, whilst toxic results are not seen until the dosage is trebled. For poultry it can be given as 0·5 to 2 per cent. of the mash with 1 per cent. as a sufficient and safe dose. According

to Joshua (1943) 1 gramme per 4 lb. or even more can be administered to rabbits on two consecutive days and repeated several times at intervals of ten days.

*Sulphamezathine* has been little used except for coccidiosis in chicks when dosage at the rate of 1 to 2 per cent. of the mash has been used or, better, a saturated solution provided as drinking water. Estimating 30 c.c. as the daily intake this means about 0·5 mgm. per gramme (or 1 gramme per 5 lb.) body weight. Its toxicity is low.

*Succinyl-sulphathiazole* has also yet been little used in animals. Calves given 1 gramme per kg. (2·2 lb.) daily divided into three doses have shown faecal levels of 1,500 mgms. per cent, although blood levels remained below 0·6 mgm. per cent. Half this dose should be ample for therapeutic purposes in intestinal infections.

## Toxicity

Animals appear able to withstand relatively larger doses of the sulphonamides than human beings. Nevertheless, overdosage may produce serious or fatal results, particularly if administration is continued for more than a few days.

Symptoms common to all include dullness, weakness and locomotor incoordination, varying degrees of anorexia, drop in milk yield in cows and some degree of fever. These symptoms seem to run parallel with the blood concentrations and mild symptoms of this kind are common and to be accepted, particularly with the older sulphonamides. Diarrhoea, often pronounced, occurs with sulphanilamide. Some degree of dermatitis is not uncommon, particularly if treatment is continued beyond seven or eight days, and includes a dry scaly nose in cows and lesions on the udder and teats. Some icterus has occasionally been reported.

More serious symptoms are those due to acetylation of the drug and consequent renal symptoms, reported with sulphaguanidine in calves and pigs and also with sulphapyridine but not so far with sulphathiazole or sulphanilamide. These include renal colic with pain in the lumbar region, kicking at the belly in bovines, stiffness of the hindquarters, dribbling of urine, sometimes bloodstained, and eventually anuria due to blocking of the kidney tubules by deposits of the acetylated drug. At *post-mortem* examination lesions of nephrosis are present. If symptoms of this kind appear treatment should be suspended temporarily or permanently and attempts made to increase the water intake.

Leucocytosis has been reported but leucopenia is the common finding, sometimes with a lowered red cell count. The agranulocytosis and acute haemolytic anaemia which sometimes occur in humans have not been reported in animals.

The above remarks apply particularly to sulphanilamide, sulphapyridine, sulphathiazole and sulphaguanidine. Insufficient is yet known regarding sulphacetamide, sulphadiazine, sulphamezathine and succinyl-sulphathiazole, or diamino-diphenyl sulphone in animals. The latter is, however, less toxic to cows than sulphanilamide and does not cause diarrhoea.

## Clinical Application

Sulphonamide administration should in general be limited to infections in which there is adequate experimental or clinical evidence of their value. Many of the sulphonamides are in short supply or unobtainable for use in animals at the present time. Some are much more costly than others. The most available and economical drug that will do what is required will therefore be chosen. Sulphanilamide and sulphapyridine, and sulphaguanidine for intestinal infections, have so far been most widely used. General treatment will be of more value in acute cases than in chronic cases or those in which there are large accumulations of pus or bacteria. Where possible these should be attacked by surgical measures and local application.

The sulphonamides are all of low solubility in water, ranging from 0·8 per cent. for sulphanilamide (at 25° C.) to 0·01 per cent. for sulphadiazine, and are generally administered by the mouth as solids or in suspension. For use by other routes there are the sodium salt of sulphacetamide which is neutral, the sodium salts of sulphapyridine, sulphathiazole and sulphadiazine which have, however, the disadvantage that they are strongly alkaline and have therefore to be used with great care owing to the danger of tissue irritation and necrosis, and various other solubilised preparations which include soluseptasine (≡ 35 per cent. sulphanilamide), E.O.S. (≡ 50 per cent. sulphanilamide), L.S.F. (≡ 15 per cent. sulphanilamide), solupyridine (≡ 45 per cent. sulphapyridine) and solu-thiazole (≡ 44 per cent. sulphathiazole).

Intravenous administration of one of the soluble preparations may be used but has little advantage since blood concentrations rise quickly after dosing by the mouth, except in hyperacute cases or where the drug cannot be administered by the mouth. Subcutaneous administration has no advantages since absorption is slow and apt to be irregular. Intraperitoneal administration of suspensions are used for peritoneal infections. For udder infections the sulphonamides can be administered in solution or as suspensions in various vehicles. For local application to wounds and sinuses they are used as powders or made up as ointments. The subject of their local use is a big one in itself and will not be further dealt with here.

## Clinical Reports

In this section, mention will be made of the main reports on sulphonamide therapy in animals to show the diseases in which it has been used and the general results obtained. No attempt will be made to deal exhaustively with the subject, but the references to the original papers will be given.

*Mastitis.*—Administration of sulphanilamide *per os* in clinical bovine mastitis is followed by disappearance of symptoms in about 50 per cent. of cases for at least three months but with sterilisation of the infection in only about half of these (Stableforth and others, 1942, who give refs. to other reports). Sulphanilamide E.O.S., and L.S.F. by udder injection have also been reported of considerable value for the removal of clinical manifestations (McEwen, 1942, Hignett, 1942). Sulphanilamide in liquid paraffin—50 c.c. of a 38 per cent. suspension daily for four days—has also been reported of high value for the elimination of *Str. agalactiae* infections and better still if a second series of injections is given (Kakavas and others, 1942. Palmer, 1942). Sanders (1943 a and b) reported good results with sulphanilamide in iodised mineral oil. Experiments have not so far shown that other sulphonamides are of greater value than sulphanilamide but observations are few. Diamino-diphenyl sulphone has also been used in a small number of cases with useful results, and no toxic effects (McEwen *et al.*, 1941 and 1942, Hignett, 1942). In summer mastitis due to *C. pyogenes* Thompson (1940) reported useful results, particularly in alleviation of the general symptoms, with sulphapyridine, but this finding was not confirmed by either Roach (1942) or Arthur (1943). Good results have been claimed for the same drug in mastitis of ewes, but a controlled trial in experimentally produced staphylococcus mastitis in ewes has not shown it to be of any value (Weybridge Laboratory, unpublished).

*Br. abortus infections.*—Neither sulphanilamide nor sulphapyridine or sulphathiazole have proved of value (many authors).

*Respiratory Infections.*—Sulphanilamide has proved of high value in the common respiratory infections of equines (Hignett, 1940, Hignett and King, 1940, Bazeley, 1940), and in strangles if given early (Gould, 1943). It has also been of value in various conditions in foals. Good results have been obtained in calf pneumonia with sulphapyridine and also with sulphathiazole and sulphadiazine (Lamont and Kerr (1939), Thorp, Shigley and Anderson (1942), Shigley and Thorp (1943), Thorp (1943)). Shanks (1939 b) found sulphapyridine of great value in pneumonia in young pigs. Sulphapyridine has also apparently been used in transit fever in this country with good results. According to Bryan (1941 a and b, 1942 b), both sulphapyridine and sulphathiazole are of value in respiratory infections in dogs and cats, including those following distemper. Hamilton (1943) reports good results in the prevention and cure of infectious coryza in chickens with sulphathiazole.

*Intestinal Infections.*—Good results have been reported with sulphaguanidine in calf scours (Wise and Anderson, 1942, Thorp and Shigley, 1942, Shigley and Thorp, 1943). This drug has also proved of great value in necrotic enteritis of pigs (Slavin, 1942, Kernkamp and Roepke, 1942, 1943, Cameron, 1942, Davis Hale and Freeman, 1943). Bryan (1942 c) claims useful results with the same drug in diarrhoeas in dogs and cats due to salmonella or following distemper. The same author (1943) reports useful results in diarrhoeas of dogs and cats with succinyl-sulphathiazole. This drug was also used in calf-scours by Herriot (1943), Thorp (1943) and Thorp, Pisciotta and Grundy (1944) with good results.

Favourable results have been reported with sulphaguanidine in experimental infections with *Coccidia bovis* and in natural coccidial infections in calves (Boughton. 1941, 1943 a and b). Arthur (1944), however, had no success in this country. Prevention of infection in lambs and reduction of heavy sub-clinical infections with sulphaguanidine have been reported (Foster, Christensen and Habermann, 1941, Christensen and Foster. 1943), whilst Hawkins, Cole and Thorp (1943) reported alleviation of symptoms with both sulphaguanidine and succinyl-sulphathiazole in a natural outbreak if treatment was begun early. Sulphaguanidine has been shown to be a preventive for caecal coccidiosis of chickens (Farr and Allen, 1941, 1942, Levine, 1941, Horton-Smith, 1942, Allen and Farr. 1943, Beach. 1943, Levine, 1941, 1943), whilst sulphadiazine and sulphamezathine are curative up to 48 hours after infection (Horton-Smith and Taylor, 1942 and 1943, Hawkins, 1943). Joshua (1943) used sulphaguanidine (two successive days only and repeated three times at ten-day intervals) in rabbits and reported that the results were apparently useful in controlling coccidiosis although no controls were used. It is apparently of no value in coccidiosis in dogs (Whitney, 1941).

*Calf Diphtheria.*—Sulphapyridine and sulphathiazole have both given almost 100 per cent. recovery with marked improvement

within 24 to 30 hours and complete cure in four to seven days. A single intravenous dose (3 grammes of the sodium salt per 100 lb.) was sufficient in most cases but some relapsed, unless supporting oral treatment was given, and needed a further intravenous dose in five or six days. Sulphanilamide was less effective. (Farquharson, 1940 and 1942, White, 1943).

*Rickettsia Infections in Dogs.*—Good results have been reported with sulphapyridine, which was more effective than proseptasine. (Carmichael and Fiennes, 1942).

*Joint Ill.*—Excellent results have been reported in the treatment of joint ill in lambs with sulphanilamide (Blakemore, 1939), whilst good results have been reported with this drug in joint affections in other young animals. Shanks (1939 a) and Lamont (1939) found sulphapyridine of great value in "influenzal arthritis" in young pigs.

*Metritis.*—From unpublished information sulphanilamide appears to be of value in acute metritis in mares and possibly in other animals, and sulphapyridine in most species.

*Fowl Cholera.*—Shanks (1941) found sulphapyridine of considerable value in an outbreak of this disease in turkeys.

*Wound Infections, etc.*—The value of the sulphonamides, particularly sulphanilamide because of its higher solubility, for the prevention or treatment of infection in wounds, sinuses and body cavities is well attested but will not be dealt with further here. (Useful papers on this subject include those of Stevens and others (1941), Britton (1942), Hawking (1942), Hawking and Hunt (1942), Hudson and Smith (1942), Bryan (1942 a, b), Swann (1942), McLennan (1942), Gould (1943), Ranson (1943), Millar (1942), Farquharson (1943), Hawking (1943), Hare and Clark (1943), McIntosh *et al.* (1944).)

Further details of many of the reports cited will be found in the Annual Review "Advances in Veterinary Medicine" (*Veterinary Record,* 1943, prepared by J. Francis). Gould (1943) also deals with many aspects of sulphonamides in veterinary practice. "The Medical Uses of Sulphonamides" (Medical Research Council, 1943) provides an authoritative review of their use in humans. It also provides a list of proprietary and other synonyms.

To sum up: there is still much to be done on both the experimental and clinical aspects of sulphonamide therapy in animals, and reports from the field are badly needed. The value of these will be much enhanced if they include laboratory diagnosis of the actual infection. The discovery of these drugs has provided us with tools of exceptional value. Their action is mainly bacteriostatic and other established methods of treatment such as the use of antisera and antitoxins and surgical measures should not be neglected. They act best in acute cases and in the early stages before organisms are too numerous or enveloped in foci of pus or necrotic tissue. The decision to use or not to use them should therefore be made early and on a sound experimental or clinical basis, and dosage should be adequate and sustained by repetition at intervals which will keep up a sufficient level in the blood, intestinal contents or other sites at which they have to act. Finally, they are not all powerful in range or activity but are only effective in well defined—though for some fairly wide—therapeutic fields.

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## Discussion

Mr. Shanks, in opening the discussion, said that he had had a fair amount o experience of the use of sulphapyridine in Northern Ireland, mainly in pigs suffering from pneumonia. He had found that small doses had proved satisfactory. The dose had been six tablets t.i.d. (9 grammes in the day). Recovery was usual after one day's treatment. He had met one case of probable poisoning. It had occurred in a pig which had been badly affected and had received 27 tablets daily for three weeks. It had not responded to treatment but when this was stopped the pig recovered spontaneously. Calves suffering from influenza or pneumonia responded to sulphapyridine in doses of 1 gramme daily per 30 to 40 lb. body weight. Postparturient fever of sows responded well to treatment with sulphapyridine. No particular organism had been established as the cause. He had found that the higher the temperature the better had been the results. He stated that M. & B. 693 had been used successfully as a prophylactic in arthritis of young pigs. It was also useful in the treatment of summer mastitis if used early. It prevented the spread of infection. He thought that the type of summer mastitis found in Yorkshire was less acute than that prevailing in N. Ireland. He had found that 693 used in turkeys suffering from cholera had been helpful. Finally he wondered could 693 be used externally for eczema or grease?

Mr. Sinclair: He used sulphanilamide in cod-liver oil in conjunctivitis. For foals with joint-ill he overcame the difficulty of drenching by giving it in a ball of butter.

Mr. Scott: He had found sulphanilamide useful in the mare after foaling. He also found it gave good results in joint-ill in lambs and metritis in ewes, but goats he found were disappointing subjects. The type of strangles being encountered now was different; it was more of a nasal catarrh and in this stage sulphanilamide was good.

Mr. Guthrie found that the joint-ill in lambs on lowland farms responded to sulphapyridine. Metritis in ewes in the dales was an anaerobic infection and they responded to *chauvoei* antiserum and sulphapyridine.

Mr. G. S. Powley wondered if by using the sulphonamides prophylactically there might not be a danger of the infective organism becoming tolerant. He mentioned one case in which a litter of young pigs were dying. Mastitis in the sow was diagnosed and treated with sulphapyridine with very good results. He found sulphapyridine more satisfactory than sulphanilamide in the treatment of mastitis.

Mr. J. C. Powley: Although good results might be obtained with sulphonamides in the treatment of necrotic enteritis of pigs, it must be remembered that it was a disease of bad hygiene and that must be attended to first. Continuing, Mr. Powley said they were fortunate in having Messrs. D. G. Ardley, R. Paisley and J. A. G. Fraser present and he hoped they would have something to say.

Dr. Ardley: He wished first, on behalf of his colleagues and himself, to express thanks for the kind invitation to visit the meeting and take part in the discussion. Being interested in the comparative aspects of therapeutics and allied subjects, he welcomed this opportunity of hearing from Dr. Stableforth and subsequent speakers of the progress and present position of sulphonamides in veterinary therapeutics. Not being a veterinary surgeon it would be an impertinence on his part to engage in any discussion on the purely clinical aspects of their work, but the subject of sulphonamide therapy provided an opportunity for entering into the discussion, particularly as regards fundamental aspects which are applicable to both man and domestic animals. Dr. Stableforth, after referring to the original work of Domagk and the discovery by French workers that the azo sulphonamides are split up in the body with release of sulphanilamide, then drew attention to the important clinical work by Colebrook and others on the sulphonamide treatment of human puerperal sepsis and septicaemia as being the next important stage in the development of the subject. He (Dr. Ardley) was inclined to regard the discovery and introduction of M. & B. 693, now generally known as sulphapyridine, as the third outstanding event, as not only did it provide a compound which was much more active than those previously available, but it was the precursor of the subsequent heterocyclic amide substituted derivatives of sulphanilamide which had been introduced or which were undergoing investigation. He mentioned this because although the importance of clinical trials was obvious he felt that the probable therapeutic applications of a sulphonamide could be predicted fairly accurately from laboratory work. It must be borne in mind that sulphonamides were not used to treat diseases as such but to influence the course of certain infections and that if an organism was found in the laboratory to be relatively insusceptible to the action of a sulphonamide, the compound would be of little or no value for the treatment of an infection due to that organism. It had been mentioned that the

sulphonamides were not effective in brucellosis, which was undoubtedly the case, and which would be expected from laboratory investigations, despite which numerous reports of alleged cures of undulant fever in man had appeared in the literature. Undulant fever was naturally a condition in which a mistaken clinical impression of response to a treatment could easily occur. The negative results clinically in swine erysipelas were in accordance with the negative experimental findings which had also been mentioned, so reports he had seen of alleged cures of the human skin invasion by the erysipelothrix were difficult to understand.

While the nature of the aetiological agent in an infection was fundamental, in sulphonamide therapy there were doubtless occasions on which empirical trial was justified, as suggested by Dr. Stableforth, such as in the absence of laboratory data or a bacteriological diagnosis, provided it was borne in mind that it was the latter rather than the clinical diagnosis which was the important factor.

Dr. Stableforth had stated that sulphapyridine and sulphathiazole were not more active than sulphanilamide on *Streptococcus agalactiae*. As a general principle the sulphonamides were, with minor variations, not specific in their action on bacterial species. The question was primarily one of degree of susceptibility or insusceptibility on the part of the organism to sulphonamide action and degree of activity on the part of the compound. As sulphapyridine, and still more so sulphathiazole, were more active compounds than sulphanilamide, one would expect them to be more active on *Streptococcus agalactiae* in the laboratory and consequently that at the same blood concentration they would be more effective clinically. He should be interested to hear of any further data on this subject.

Dr. Stableforth mentioned that a leucocytosis might occur early during the administration of a sulphonamide but any effect on the white cell count was usually a leucopenia. An early leucopenia from sulphonamides was of little importance but in man, at any rate, a late leucopenia was potentially dangerous. Leucocytosis did sometimes accompany the acute haemolytic anaemia which occasionally occurred in man, and also he believed in horses, but the only leucocytosis usually observed was that which occurred in acute coccal infections due to the disease. The question of crystal deposition and fluid intake had been mentioned and in man the prevention of crystalluria during the administration of sulphapyridine, sulphathiazole, sulphadiazine and allied compounds was one of the most important precautions to take. He imagined that prevention would be more difficult in domestic animals. In man the signs and symptoms of crystalluria were any or all of the following: macroscopic haematuria, abdominal pain and oliguria, and in an animal, whereas macroscopic haematuria would be obvious, of course, he would not complain of pain nor would the urinary output be measured. With regard to prevention, it was one thing to take a horse to the water and another thing to make him drink. It might be of interest that during administration of sulphathiazole and sulphadiazine the maintenance of a sufficiently alkaline urine by the administration of alkalies helped in preventing crystal deposition, although this was of little value in the case of sulphapyridine as the solubility of the latter and its acetyl derivative did not vary appreciably throughout the pH range of the urine. Possibly when sulphathiazole and sulphadiazine were used more in veterinary practice the administration of alkalies for this purpose might be found to be a useful adjuvant by veterinary surgeons.

Dr. Stableforth had mentioned that for intestinal infections a drug with poor absorption was needed. The higher concentration in the intestines secured by such a drug might result in greater effectiveness as well as reduced systemic toxicosis but he doubted if this requirement was essential. In human acute bacillary dysentery, well absorbed compounds such as sulphathiazole were quite effective. Possibly the answer was that in an infection with an early bacteraemic or septicaemic phase followed by intestinal localisation systemic therapy would be of value initially and a poorly absorbed compound superior for later use. It was not the case that sulphadimethyl-pyrimidine (sulphamezathine) had similar properties to sulphaguanidine; on the contrary, it was well absorbed. Its selection for trial in coccidiosis was doubtless based on the fact that owing to its greater solubility in water than sulphapyridine or sulphathiazole an adequate dose would be taken by the birds by dissolving it in drinking water. If administration in the mash was used then this special feature of the compound would not apply and one would expect allied compounds to be effective also.

It was difficult to believe that sulphonamides had any real influence on the virus of canine distemper whether a spontaneous infection in dogs or an experimental one in ferrets. Any clinical effects observed must be due to an action on secondary bacterial invaders, this applying generally to virus infections followed rapidly by bacterial invasion such as some of the pig infections mentioned by Mr. Shanks. The latter's observation that a sulphonamide worked better when the temperature of the animal was high was in accordance with findings both experimental and in clinical human medicine. That the bacteriostatic action of sulphonamides was greater at fever compared to normal body temperature was one of the reasons why in acute infections treatment should be begun early with high initial dosage.

Mr. PAISLEY emphasised the necessity not only for adequate dosage, but that the treatment should be continued until the practitioner was satisfied the correct and desired result had been obtained. Reports from the field indicated that a large proportion of relapsed cases could be traced to the drug being stopped as soon as clinical improvement or recovery was apparent. From this point it was highly desirable that at least two, if not three, of the supporting eight-hourly doses should be administered, thereby clinching successful treatment. Dr. Stableforth quoted the necessity of bearing in mind the economic angle when deciding which particular sulphonamide drug should be employed in combating a known bacterial infection. If an organism was susceptible to sulphanilamide, sulphapyridine and sulphathiazole, it was not correct to state that the lower basic cost of sulphanilamide should make that drug the treatment of choice. The speed with which a result could be obtained was of paramount importance, and if one of the more active drugs was calculated to provide a shorter period of illness with a corresponding shorter convalescence and loss of condition, these factors must also be weighed up in deciding whether the more expensive drug might not in fact be the cheapest in the end. Dr. Stableforth mentioned the use and value of sulphanilamide in large animal practice, but where the bovine was concerned the outstanding success obtained by practitioners in the North of Scotland with sulphapyridine in the treatment of transit fever was of outstanding interest. Many private reports indicated that sulphapyridine constituted the most satisfactory treatment, and in the opinion of the practitioners concerned the increased cost was justified by the reduced death-rate experienced, and the shorter course of drug treatment which was found to be necessary.

Mr. WATSON reported the case of a dog which had had its leg almost severed by a mowing machine. As the leg had been attached only by a strip of skin he had advised slaughter. However the owner would not consent. He then packed the wound with sulphanilamide and bandaged with plaster. Recovery had been sensational and the dog was now using the leg.

Mr. VARLEY asked if the sulphonamides were likely to cause sterility and, if so, what would the duration of the sterility be.

Mr. MARSHALL discussed the scouring caused by sulphanilamide and asked if it could safely be combined with kaolin.

Mr. LOFTHOUSE reported that he had obtained good results with sulphapyridine in the treatment of joint-ill in lambs. It also gave good results in infectious pneumonia of calves. He also reported one outbreak of mastitis in which sulphanilamide had failed to clear up the condition but which had yielded to sulphapyridine.

Mr. WITHERS reported that he had found sulphapyridine good in the treatment of acute pneumonia in three- to 4-day-old pigs. Before treatment was commenced death occurred in a few hours after the onset of symptoms. He used sulphanilamide extensively in surgical cases, but he wondered if they were not running a risk by not first ensuring that the powder was sterile.

### The Reply

Mr. Shanks had contributed much to the discussion. The point regarding the enhanced effect of the sulphonamides in animals with high temperatures was one which he should have mentioned since it was generally agreed. He had no information regarding the value of sulphapyridine in eczema or grease. He could not give a categorical answer to Mr. Sinclair's question whether cod-liver oil as a vehicle would interfere with the action of sulphanilamide but he thought not. In answer to Mr. Adams the present view was that there was no reason for withholding mag. sulph. or eggs during treatment with sulphonamides. He saw no reason why the use of $H_2O_2$ on wounds should interfere with the action of sulphanilamide. Perhaps Dr. Ardley would be able to give a definite reply. Both Mr. Scott and Mr. G. S. Powley had raised the question of dosage when sulphonamides were used prophylactively. There was some danger of producing resistant strains and for that reason dosage should be adequate, though it could be a little lower than those used for curative purposes. He was interested in Mr. Powley's finding that sulphapyridine was of more value in mastitis than sulphanilamide because there was no published information on this point. In his (Dr. Stableforth's) hands it had not proved any more effective for *Str. agalactiae*, but more information was needed. Mr. J. O. Powley's point that hygiene was of primary importance in necrotic enteritis was worthy of emphasis. Mr. Guthrie's remarks on the value of combining *Cl. chauvoei* antiserum and sulphapyridine for septic metritis in ewes brought out the importance of not neglecting other established methods of treatment when using sulphonamides. Dr. Ardley had added a great deal to the discussion and raised certain points for reply. He had not said that sulphapyridine and sulphathiazole were not more active than sulphanilamide on *Str. agalactiae* but had in fact emphasised in his paper the higher activity of the two former compounds on bacteria in general. They might well work better in the field but what he had said was that no evidence had yet been published to show this. He agreed that the leucocytosis reported by some authors was probably a result of the disease and not the treatment. Whilst the animal could not tell one where the pain was, there was definite signs which to an experienced veterinary surgeon indicated that colic was of renal origin. It was true one could not make an animal drink but if necessary fluid could be administered by stomach tube. Dr. Ardley's point regarding the administration of alkalies was one he should have mentioned. Dr. Ardley had cited acute bacillary dysentery in humans as an example that well absorbed compounds were effective in intestinal infections. He (Dr. Stableforth) ventured to suggest that the reason was at least partly that there was in the disease an important bacteraemic phase. Dr. Ardley had corrected his slip in regard to sulphamezathine. Both this speaker and Mr. Shanks had raised the question of the action of sulphonamides in virus infections. There was evidence that some members acted on certain viruses, *e.g.*, that of neurolymphomatosis of chickens, but he agreed that in most of the cases reported of clinical effects in virus diseases, the action was probably on the secondary invaders. In regard to swine erysipelas he was referring to laboratory tests in experimentally infected mice.

Mr. Paisley queried his suggestion that the cheapest effective drug should be used, on the grounds that some drugs, although effective, might not bring about a cure so quickly as others. The speed of recovery was of course an important consideration and one which was, to him at any rate, included in the term "effective." He (Mr. Paisley) wondered whether some difference in dosage and tolerance might not exist in different areas, similar to the difference in the dosage rate for aloes in the North and the South. There seemed no need to postulate such an explanation in regard to the sulphonamides because marked differences, *e.g.*, in the degree of diarrhoea following sulphanilamide, could be seen in cows in the same shed or on neighbouring farms where no difference in breed, management or feeding could be incriminated. His (Mr. Paisley's) remarks on the use of sulphapyridine in transit fever were valuable because none of this information had been published. In reply to Mr. Fraser, symptoms of renal colic and definite evidence of blocking had been seen both here and in America, following sulphonamide administration. Mr. Varley had asked whether sulphonamides caused sterility. This had been reported in humans, but how long it lasted he did not know. He knew of no reports in regard to animals. Mr. Lofthouse's finding in regard to mastitis that sulphapyridine succeeded on some farms where sulphanilamide had failed, deserved reporting in detail; information of this kind would be of value to others. In answer to Mr. Withers there was some risk in using sulphanilamide which was not sterilised for surgical cases. Replying to Mr. Marshall, he saw no reason why sulphanilamide should not be mixed with kaolin for oral administration.

## THE MENACE OF FOOT-AND-MOUTH DISEASE OFFENCES

The Ministry of Agriculture, in a recent announcement, states that during recent months a number of farmers have been fined sums up to £25 for such offences as feeding unboiled swill to pigs, failing to report suspected cases of foot-and-mouth disease, and moving animals illegally in a foot-and-mouth disease infected area. "But that is only a fraction of the story. Farmers who are guilty of these offences are not only risking danger to their own animals, but are a menace to all other farmers in the locality and to the country at large. Carelessness over such matters can cause, directly and indirectly, very serious loss to hundreds of individual farmers and to the nation. In particular, farmers should be careful to see that any swill that does not come from one of the central processing plants is boiled for a full hour before being fed to, or brought into contact with animals, and also that they themselves do not carry infection from unboiled swill to their animals on their hands or their clothing or through using containers that have been used for raw swill and not sterilised afterwards."

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### Weekly Wisdom

*Indeed, if the satirists would but realise it, man, so far from being at his most ludicrous, nears his highest when he makes his New Year resolves. He is utilising the mightiest of world-forces, that of human volition, transcending in power all mechanised energy. —The Times.*

* * * * *

As a result of the growing interest in modern veterinary methods in Kenya, the Colony's Veterinary Research Laboratory reports that the demand for animal vaccines now equals, in four months, what would normally constitute a year's supply.—*African World.*

THE VETERINARY RECORD

January 6th, 1945

## VISIT OF PRESIDENT TO THE CARIBBEAN COLONIES

THE forthcoming transatlantic visit of Professor Wm. C. Miller creates a situation which is probably unique in the history of the Association. It is doubtful whether a President has ever before been abroad during his term of office.

Council has made it abundantly clear that it wishes the President to act as Ambassador for the Association and the profession, and is confident that the opportunity of increasing the goodwill which exists with our American colleagues, the A.V.M.A. and others, will not be lost. The presence here of many officers of the United States Army Veterinary Corps has been a welcome one, and we are pleased to have the opportunity of returning the visit. Our President will have the pleasure of meeting the members of the N.V.M.A. resident in the various colonies visited, and of extending to them personally greetings from the parent body—an opportunity which must seldom be possible in an Association which has members all over the world.

It may have been felt by some that the absence of the President from the country at this juncture would possibly hamper the affairs of the Association at home, but we are extremely fortunate in having a Senior Vice-President who has the confidence of the whole Association, and the potential opportunities for good which may arise by virtue of contacts which will be made by Professor Miller will far exceed any minor domestic hindrances which may occur.

We take this opportunity of wishing him every success in his important duties and God-speed on his voyages.

### ADVISER ON DEVELOPMENT PLANNING IN THE COLONIES

The Secretary of State for the Colonies has decided, in connection with plans for increased activity in Colonial development after the war, to create a new post of Adviser on Development Planning. Sir Frank Stockdale, K.C.M.G., C.B.E., at present Comptroller for Development and Welfare in the West Indies, has accepted the Secretary of State's invitation to fill this post, and is expected to take up his new duties about the beginning of April.

The Secretary of State has also appointed Mr. J. S. Macpherson, K.C.M.G., at present head of the British Colonies Supply Mission in Washington and a member of the Anglo-American Caribbean Commission, to succeed Sir Frank Stockdale as Comptroller for Development and Welfare in the West Indies and British co-chairman of the Caribbean Commission.

Sir Frank Stockdale, who was appointed Comptroller for Development and Welfare in the West Indies in July, 1940, is an authority on tropical agriculture. He has had wide experience of Colonial territories, having held appointments in the West Indies, Mauritius and Ceylon. He was Agricultural Adviser to the Secretary of State for the Colonies.

Mr. Macpherson, whose knighthood was announced in the New Year Honours, entered the Colonial Service in 1921. He has held administrative posts in the Federated Malay States, and was Chief Secretary in Palestine and Nigeria. He was appointed to Washington in September, 1943.

* * * * *

The Argentine Ministry for Agriculture has issued a statement on declarations made in the House of Commons on vaccine against foot-and-mouth disease, saying that the Argentine authorities appreciate the importance of the problem and are preparing the vaccine as advised by the British representative, Captain Vincent Boyle, in increasing quantities. The statement adds that tests taken on 10,000 animals and their results give grounds to hope for practical results.—*Reuter.*

## CLINICAL COMMUNICATIONS

### Worm Infestation in a Foal

HENRY TAYLOR, F.R.C.V.S.
HAYWARDS HEATH

The foal, the subject of this brief note, was a pedigree Suffolk born and pastured at a farm where for some years the land had been used for rearing horses.

*History.*—The foal, a filly, was born February 22nd, 1943, and was kept in a box at the farm for a few weeks, being later on turned out with its dam as soon as the weather became warmer into a small paddock near by. The foal did well and throve.

On the morning of June 3rd our attendance was requested, as it showed slight colicy pains with constipation. The bailiff remarked that the day previous he had noticed it lying down a lot, but did not suspect anything wrong. The animal received the appropriate treatment and again at 8.30 in the evening, but in view of one of the *post-mortem* findings it is satisfactory to recall that there had been no strong aperients administered. It died during the night after getting gradually weaker.

*Post-mortem Examination.*—This was made next morning, June 4th. The pylorus of the stomach was blocked with a collection of *Ascaris megalocephala* worms and numerous others were mixed with the stomach contents; there was a displacement of the large intestine and an intussusception of part of the ileum near the ileocaecal valve, the portion intussuscepted being some 15 inches long. The anterior mesenteric artery had numerous larvae. The mucous membrane of the caecum contained larvae of the *Cylicostomum tetracanthum* (now called *Trichonema* spp.) and there were only two specimens of what appeared to be *Strongylus vulgaris* seen.

*Remarks.*—The foal when it became ill was only three months and eight days old; it is thus an example of a fatal case of strongylosis in an unusually young animal. Dr. E. L. Taylor, of the Ministry's laboratory, states that in the case of the species *Strongylus* the period between the ingestion of the infective larvae and the appearance of eggs in the faeces is something like three months. The parasitic developmental cycle for the species *Trichonema* is only about a month.

The intussusception was not caused by any violent purgative but followed the interference with the blood supply of the anterior mesenteric artery.

* * * * *

### Ovarian Tumour In the Cow

HENRY TAYLOR, F.R.C.V.S.
HAYWARDS HEATH

The Sanitary Inspector of this district examines all the carcases in the Government controlled slaughterhouse in this town, and during one of the inspections recently came across an ovary which was evidently the seat of a neoplasm—an experience practically unique in his 20 years' work of examining carcases. The ovary of the cow is of greater importance to-day than formerly owing to the work on sterility, the examination of cows and the expression of corpora lutea, and as Mr. J. L. Kenny in *The Veterinary Record* of February 26th, 1944, in his article on Bovine Neoplasia, out of 214 cases does not mention any ovarian tumours, the finding of this one seems worth recording. There is no history available except that the animal was an aged cow in fair condition, dry, and was "graded" in the market. She showed no sign of pain during life or any illness.

On slaughter the carcase was normal except that one ovary was as large as an association football with a smooth thick capsule, and of the consistency of lymphoid tissue. A section of the tumour was sent for microscopical examination, the report being to the effect that the tumour is a spheroidal-celled carcinoma, rather fibrous, therefore not suggesting a rapid growth—which agrees with the appearance. (If any pathologist would like to examine the slide, I shall be pleased to send it.)

In a recent "incident" a young woman living in a row of houses which was hit by a V bomb owed her life to two R.A.F. rescue dogs. For more than four hours after the bomb fell the dogs worked along the row. They stopped on a pile of rubble and barked excitedly. After digging for ten minutes and scarcely believing it possible that anybody could be alive under it, rescue workers came to a Morrison shelter and found the woman inside. She had only minor injuries but was almost suffocated. Several persons were killed and a number were injured.

## ABSTRACTS

**[The Effectiveness of a 1:14 Phenothiazine-Salt Mixture in Controlling Nematode Infection in Sheep.** Peterson, E. H., Kammlade, W. G., and Webb, R. J. (1944.) *Amer. J. vet. Res.* **5**. 228.]

Working at the Dixon Springs Agricultural Experiment Station, Pope County, Southern Illinois, the authors divided about 600 mature ewes by random division into three lots of 196 each in January, 1943, when they were brought in for dry-lot feeding. Each ewe was given 2 oz. of a 50 per cent. suspension of phenothiazine in water and molasses. Similar doses of this drug had been given in August, September, October and November. From February to April lambing proceeded. From January 15th onwards Lot 3 had access to a mixture of one part of phenothiazine and 14 parts of salt and also to bonemeal and limestone without salt; Lot 2 had free access to bonemeal and limestone with salt and was dosed with phenothiazine (1 oz. per ewe, 0·5 oz. per lamb) at the beginning of the pasture season and thereafter was maintained on a 1:14 phenothiazine-salt mixture. Lot 1, the controls, was not dosed, but had access to the salt, limestone and bonemeal. The degree of parasitism was gauged by egg counts done by the Stoll dilution method and also by periodical weighing and *post-mortem* examinations. The results supported the view of Leiper, J. W. G., and Peters, B. G. (1941, *J. Helminth.* **19**. 71), that the weight gain is a more sensitive index of anthelmintic efficiency than the egg count. The average daily consumption of phenothiazine per animal was 0·55 gramme.

The 348 sheep of Lot 3 (191 ewes, 157 lambs), continuously kept on 1:14 phenothiazine and salt mixture throughout the "dry-lot and grazing seasons" and handled as an isolated unit without contact, direct or indirect, with the other lots, made a total gain in weight of 8,670 lb. between May 27th and August 3rd (ten weeks). One of this lot died. Their progress was considered satisfactory. *Post-mortem* examinations of 95 of them showed, however, that they still harboured parasites. The phenothiazine and salt mixture did not, therefore, eliminate the nematode infestation, but it did "markedly suppress" it. Lot 2 of 350 sheep (187 ewes, 163 lambs), treated individually with phenothiazine at the beginning of the grazing season (April 25th) and then kept on the same phenothiazine and salt mixture, was put upon a pasture which had been occupied during the previous months by the control sheep of Lot 1, *i.e.*, by untreated and parasitised sheep. It was expected that they would pick up the infestation on this pasture and they did. They gained only 10 lb. during the period May 27th to August 3rd and 14 of them died. Three were killed because of their debility. Losses would have been greater if they had not been individually treated with phenothiazine and placed on a clean pasture. *Post-mortem* examinations of 20 of them showed that they were heavily parasitised.

The authors conclude that, under the conditions of this experiment, the 1:14 phenothiazine-salt mixture markedly protected sheep from excessive parasitism when they were relatively free from parasites at the beginning of the trial and had no contact with other sheep; but it did not protect sheep when they were put on pasture recently contaminated by untreated sheep. The authors discuss work done by other investigators on the survival of the infective larvae of nematode parasites of sheep and suggest that sheep should not be put on pasture which has been contaminated during the previous two months, that they should be given a therapeutic dose of phenothiazine before they go on the pasture and should have access, while they are on it, to the 1:14 phenothiazine-salt mixture. These recommendations apply to the Northern United States.

G. L.

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**[Acute Uraemia Associated with Uric Acid Infarcts in the Kidneys of Baby Pigs.** Madsen, L. L., Earle, I. P., Heemstra, L. C., and Miller, C. O. (1944.) *Amer. J. vet. Res.* **5**. 262.]

Heavy losses in spring and fall litters in 1942 and 1943 led to routine studies for the possible identification of the condition and yielded negative results. Spectrophotometric analyses of food, water of the sows, bones, liver and urine of affected pigs failed to demonstrate toxic quantities of poisons, nor had any recent changes been made in the feed or methods of feeding. Several symptoms in affected pigs appeared similar to those found in so-called "baby-pig disease," or hypoglycaemia. Blood sugar determinations on sick pigs often gave values within the normal range. Attempts to treat the condition by dextrose solutions and calcium-gluconate solutions failed to produce a clinical response. Autopsy findings were negative or variable, except for constant presence of a precipitate impacted in the papillary ducts of the kidney (so-called uric acid infarcts) or lying free in the renal pelvis, ureters or urinary bladder. Precipitate was usually of orange colour, but occasionally was almost white. The finding of elevated non-protein nitrogen values, along with the before-mentioned observations, indicated impaired renal function. Blood urea and uric acid showed large increases above normal level. The precipitated material consisted largely of uric acid or urates.

The cause of death was believed to be associated with acute uraemia. Affected pigs, whilst apparently normal at birth, develop symptoms within one to three days later. They fail to gain normal weight, rather tending to lose weight, hair stands on end, coat rough, and body temperature becomes sub-normal in the later stages. Pigs isolate themselves, and diarrhoea may be common. Gradually pigs become worse and go into a coma. Some appear very sensitive and will squeal feebly and have tremors when disturbed. Convulsions have been observed in advanced cases. The disease is very fatal and most pigs showing symptoms die within nine days.

Autopsy shows variable lesions, except for the kidney findings mentioned. Lungs, heart, liver and intestines are usually normal, but sometimes the liver is pale or yellowish with scattered areas of congestion. Bile is scanty and very concentrated, often containing an orange-coloured, flocculent precipitate. The kidney capsule peels easily, and the kidneys may be pale. An accumulation of precipitate in the cortex may be visible on close examination, on the surface of the kidney, even through the capsule. Pressure causes precipitate to flow in the ureter, but often the ureter may contain precipitate easily visible throughout its length. In some cases the bladder may also contain precipitate.

This precipitate has not been detected in the kidneys of normal pigs killed for examination or killed by the sow.

The authors discuss the parallelism between this condition in baby pigs and a similar condition in human infants, the latter being now rather rare if a relatively high fluid intake is established early in life, so as to stimulate kidney function. The application of this preventive therapy to the problem in baby pigs presents some practical difficulties, but since the authors found that complete or partial starvation produced a condition somewhat similar to that occurring in the field they suggest that measures to promote a prompt and adequate milk flow may be of prophylactic value.

D. J. A.

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**[A Virus Causing Pneumonia in Cats and Producing Elementary Bodies.** Baker, J. A. (1944.) *J. Exp. Med.* **79**. 159-171. (12 refs.).]

This paper is concerned with an investigation of the causal agent of a respiratory disease of cats, known as nasal catarrh, influenza or distemper, which is characterised by its highly contagious nature and long course, about a month. A severe pneumonia was produced in mice by intranasal instillation of extract of infected feline lung and could be easily maintained by serial passage. In mice the disease was not contagious nor could they be infected by intraperitoneal, intracerebral or subcutaneous inoculation, though mice treated in these ways often acquired a solid immunity against infection by nasal instillation. Other laboratory animals could also be infected—in mice and hamsters the disease was acute, often terminating fatally in a few days; in rabbits and guinea-pigs it was more mild, but in the cat alone did it have a long course. Films prepared from the lungs of mice and hamsters showed structures indicative of an agent with a life cycle similar to psittacosis and, moreover, the deposition of these structures by centrifuging coincided with the disappearance of the infective agent from the supernatant fluid. The agent did not easily pass through Berkefeld N filters. Cats were susceptible to the mouse virus by intranasal instillation; the disease produced was contagious and recovered cats were immune. The symptoms, course and lesions in the experimental disease are described and the virus was shown to be present in suspensions from the nose of cats one to two months after recovery.

A. W. G.

## ANTHRAX IN GEESE

Five Barbary geese which had access to blood from a bovine carcase dead of anthrax all contracted the disease and died, according to *Clin. Vet.* The lesions included tarry, unclotted blood, swollen spleen, pericarditis and congestion of the intestine, kidneys and liver. The diagnosis of anthrax was confirmed bacteriologically. This would seem to establish a greater anserine than gallinaceous susceptibility to *B. anthracis*.—*Vet. Med.*

## R.C.V.S. MEMBERSHIP EXAMINATIONS

### List of Successful Candidates

(*Continued from Vol.* **56**, *p.* 516)

**Glasgow**

FIRST YEAR:

Bain, Miss M. L.
Campbell, Miss D. J.
Ferguson, Wm.
Goodwin, Robt.
Grisedale, J. A.
Jackson, W. T. (C)
Paton, I. M.
Reid, A. N. D.
*Ritchie, N. D.
White, Miss C. H.

* denotes 2nd Class Honours.
(C) denotes credit in Chemistry.

SECOND YEAR:

Barr, R. B.
Bremner, D. A. T.
Crawford, Miss D. H. (P)
Garven, James
Kight, D. G.
Main, Wm.
Murphy, Miss L. I.
Taylor, P. E.
Williams, Miss L.
Wright, Miss C. M. F.

(P) denotes credit in Physiology.

THIRD YEAR:

Barr, W. A. B.
Cullen, J. T.
Evans, L. A.
*Lamond, J. L.
Macdonald, Miss E. F. F.
McGown, S. W. (H)
Nimmo, I. S.
Robertson, J. S.
Smith, Miss A. M.

* denotes 2nd Class Honours.
(H) denotes credit in Hygiene.

FOURTH YEAR:

Aird, J. S.
Campbell, D. T. J.
Galbreath, Miss M. C.
Howie, T. W. T.
Jarrett, Thos.
Johari, M. D.
Lapraik, R. D.
McDonald, Andrew
McGregor, R. J. L.
McIntee, D. P.
McKenzie, Alex.
Marshall, T. B.
Porter, Miss E. V.
Provan, J. W.
Wilson, Andrew

FINAL YEAR:

Forsyth, Harry
Gregg, J. R.
Gregor, Alex.
Heatley, David
Moodie, Miss M. P.
Sillars, David

(*To be concluded.*)

## NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

### Diary of Events

Jan. 10th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

Jan. 24th.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington, 2 p.m.

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### Absence of President from Britain

Tht President, N.V.M.A., has left Britain for some three to four months during which he expects to visit, on behalf of the Colonial Office, most of the British Dependencies in the Caribbean area. He will make a survey of the conditions of breeding, feeding and management of livestock, and the conditions of the livestock industry in the various Crown Colonies and report upon measures required to effect improvement. The survey will form part of the work being organised by Sir Frank Stockdale, the Comptroller-General of the West Indies, to establish a greater measure of self-sufficiency and self-dependence in the British West Indian countries.

The President will also pay a short visit to the U.S.A. and is charged by Council to convey greetings to our colleagues of the American Veterinary Medical Association.

During the President's absence, the Senior Vice-President, Major Hancock, will serve as acting President, and the Association will in consequence be even further indebted to him. His generosity in agreeing to undertake a further spell of duty in the Presidential chair is sincerely appreciated by the members of Council.

## THE NEW YEAR HONOURS

### Dr. Minett Receives the C.I.E.

Though disappointed that the representation of members of the veterinary profession in the first section of the New Year Honours List, published on Monday, is numerically so meagre, our readers will be gratified by the award of the C.I.E. in the Order of the Indian Empire to Dr. F. C. Minett, Director of the Imperial Veterinary Research Institute, Izatnagar-Mukteswar, and of the O.B.E. to Capt. Thomas Joseph Hurley, M.R.C.V.S., D.V.S.M., Director of Veterinary Services, Madras; great pleasure also will be given by the award of the O.B.E. (Military Division) to Lt.-Colonel John Joseph Kane, of the Royal Army Veterinary Corps.

Francis Colin Minett, M.B.E., D.SC., M.R.C.V.S., was the subject of a biographical notice appearing in these columns on July 8th, 1939, at the time when he relinquished the important position of Professor of Pathology and Director of the Research Institute of the Royal Veterinary College, London, to accept his present post. The award now made to him will be widely welcomed amongst his colleagues at home and abroad as a well-merited acknowledgment of the anticipated success with which he has seized the unique and immense opportunities presented to him at Mukteswar for furthering the cause of veterinary science within the British Empire.

In a long and somewhat heavily administrative list we are glad to note the award of the C.B. to Mr. D. B. Toye, Principal Assistant Secretary, Ministry of Agriculture and Fisheries, and also tender our felicitations to Sir Alfred Webb-Johnson, President of the Royal College of Surgeons, who becomes a baronet.

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## PERSONAL

*The Late Colonel Brittlebank.*—It is regretted that some correction is required of the penultimate paragraph of the memoir of Lt.-Col. J. W. Brittlebank published on page 515 of our issue of December 23rd. His first wife was not, as stated, a daughter of Professor Williams, of Edinburgh, but Miss Powley, of York, and the description of the present Mrs. Brittlebank should have read "daughter of the late W. R. Davis, of Enfield, and a granddaughter of the late Principal Williams, founder of New Veterinary College, Edinburgh."

Colonel Brittlebank's funeral took place on Thursday, December 21st, with a service at St. Mary's Church, Sawbridgeworth, followed by cremation at Enfield. The service was conducted by the Rev. A. R. Davies (Vicar), assisted by the Rev. W. E. Beale (Curate). The family mourners were Mrs. Brittlebank (widow), Mr. J. E. Brittlebank (son), Miss M. Brittlebank and Miss R. Brittlebank (daughters), Mr. and Mrs. C. L. H. Reckitt (son-in-law and daughter), Mr. L. C. Brittlebank (brother) and Mrs. W. Brittlebank (sister-in-law). Lieut. W. R. Brittlebank (son) was unable to attend owing to active service overseas. Among the many others present were Mr. A. H. Andrew, M.R.C.V.S. (also representing the Central Veterinary Medical Society), Mr. Ramsay Millar, M.R.C.V.S., Mr. S. B. Vine, M.R.C.V.S. (also representing Ministry of Agriculture and Fisheries), and Mr. C. W. Abrams, M.R.C.V.S. (also representing the National Veterinary Medical Association).

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## SHORTAGE OF MEDICAL BOOKS: A LAMENTABLE POSITION

In the vital field of medicine unfortunately it is no longer true that "of the making of books there is no end," and a memorandum recently received from the Medical Group of the Publishers' Association surveys the reasons for the inability of medical publishers to fulfil the demands made upon them now or those that may be expected when the war is over.

The term "medical books" of course includes books on veterinary science, and in the widest aspect of this great issue the veterinary profession allies itself wholeheartedly with other scientific bodies in commending the action of this Group in rallying informed opinion in support of their plea for such treatment in the provision of paper and labour for the publication of medical books as shall bear at least a reasonable relation to need. These publishers are responsible for maintaining the supply of text-books, works of reference and monographs for doctors, veterinarians, pharmacists, research and laboratory workers, medical students, nurses and all classes of medical auxiliaries. Any reduction in their output must inevitably hamper medical education and the dissemination of

medical knowledge, and must accordingly react unfavourably upon the community as a whole.

Science in general, and medicine in particular, is indeed paying an alarming price for the flat-rate decision to reduce the paper quota to 40 per cent. of the amount used in the year ended September 3rd, 1939, if, as appears to be the case, the medical publishers have failed to secure even the modest favourable variation since accorded to our own and other scientific journals. On the specious score of "equality of treatment"—not to be confounded with "liberty of the Press"—the bookstalls still remain stocked with trivial matter, while, in some degree as a direct consequence, the supply of medical text-books is remorselessly reduced and the essential "revised" edition is fast becoming a *rara avis*. To applicants from lecture hall, classroom or laboratory "out of print" is now the stock reply. Works of reference and monographs alike remain either in MS. or, such is the despair of potential authors, unwritten.

The memorandum, concerning which this comment is made, indicates the growing magnitude of the demand for medical books, both at home and overseas, during a period of diminishing supply, and it may safely be assumed that the post-war demand for them will long continue to be far greater than present productive capacity.

"Medicine cannot stand still without injury to the whole community; equally, it cannot advance without books. It is consequently most urgent that adequate measures should be taken to improve the supply of medical books, for even if the existing difficulties could be remedied to-day, many months would pass before any appreciable improvement would be apparent."

Every possible economy in production is being practised, and we call upon those in authority to do everything in their power to remedy this lamentable situation without delay.

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## R.C.V.S. OBITUARY

Lewis, Robert N., Campbeltown, Argyll. Graduated December 19th, 1902. Died December 18th, 1944.

Vijver, Barend van der, Pretoria, S.A. Graduated July 11th, 1914. Died July 24th, 1944.

### Major R. N. Lewis, of Campbeltown

Robert Norman Lewis, M.R.C.V.S. (aged 61 years), of Delnies, Dell Road, Campbeltown, Argyll, Major late R.A.V.C. (T.F.), died on December 18th, 1944, in a nursing home in Glasgow and was interned at Nairn.

He is survived by a widow, and his son, Captain George Lewis, B.Sc., M.R.C.V.S., who was taken prisoner in June, 1940, when serving as a fighting officer in the 51st Highland Division at St. Valerie.

Major Lewis studied at the Royal (Dick) Veterinary College, Edinburgh, qualifying in 1902, afterwards practising in Nairn and Golspie. For two years he held the appointment of Veterinary Inspector in the County of Dumfries, in which duties he sustained injury in an unfortunate motoring accident, and in December, 1919, he started practice in the 50 mile long Kintyre Peninsula, in which he was greatly respected by the entire farming community and those with whom he worked, for his gentlemanly qualities and as a most efficient and successful practitioner.

His untimely passing is deeply regretted by all agriculturists and others who knew him and enjoyed his fine fellowship, advice and assistance, and sincere sympathy is tendered to his widow and son in their sad loss. It is hoped that the time is not far distant when Captain G. Lewis will be released from captivity to return in health and strength to continue the practice his father prized and cared for with such enthusiasm. G. G. R.

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## VICTORIA VETERINARY BENEVOLENT FUND

### Contributions Received

*In memory of H. E. T. Mason, M.R.C.V.S., Bishops Stortford.*

| | £ | s. | d. |
|---|---|---|---|
| Mrs. J. W. Brittlebank ... ... ... | 1 | 1 | 0 |
| Miss Constance Procter ... ... ... | 0 | 10 | 0 |
| Mr. and Mrs. W. E. Steed ... ... ... | 1 | 1 | 0 |
| Mrs. C. S. Butler ... ... ... ... | 1 | 1 | 0 |
| Mr. R. H. Sell and Mr. R. W. Adamson ... | 0 | 10 | 6 |
| Mr. Douglas E. Lacy ... ... ... ... | 0 | 10 | 6 |
| Mrs. Gabb ... ... ... ... ... | 0 | 10 | 6 |
| Mrs. Rideout ... ... ... ... ... | 1 | 0 | 0 |
| Mr. S. D. E. George ... ... ... ... | 0 | 5 | 0 |
| Mrs. G. T. Levy ... ... ... ... | 0 | 5 | 0 |
| S.A.M., A.C.M. and F.M.T. ... ... | 1 | 1 | 0 |
| Mr. Ernest Peters ... ... ... ... | 0 | 2 | 6 |
| | £7 | 18 | 0 |

*In memory of Col. J. W. Brittlebank, C.M.G., M.R.C.V.S., D.V.S.M., of Sawbridgeworth.*

| | £ | s. | d. |
|---|---|---|---|
| Professor J. B. Buxton ... ... ... ... | 2 | 2 | 0 |
| Mrs. W. Foster ... ... ... ... ... | 1 | 1 | 0 |
| Mr. G. D. Hamlett ... ... ... ... | 1 | 1 | 0 |
| Mr. and Mrs. Roberts ... ... ... | 0 | 10 | 6 |
| "V. E. Balfour and others" ... ... ... | 2 | 0 | 0 |
| Mr. Z. Deshaw ... ... ... ... ... | 2 | 2 | 0 |
| Mr. C. W. Cartwright ... ... ... ... | 1 | 1 | 0 |
| Friend of Col. Brittlebank's son ... ... | 1 | 1 | 0 |
| Mrs. Winifred M. Mason ... ... ... | 0 | 10 | 0 |
| Mr. and Mrs. Lockwood ... ... ... | 0 | 10 | 0 |
| Mr. H. W. Dawes ... ... ... ... | 2 | 0 | 0 |
| Mr. Thomas Dewe ... ... ... ... | 0 | 10 | 0 |
| | £14 | 8 | 6 |

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"*Observations on Fowl Paralysis and Some Current Conditions in Poultry Problems: Corrigendum.*—In Mr. J. E. Wilson's paper in our last issue, in the section on "Six-day Chick Disease," the following should be substituted for paragraphs 6 and 7 of that section (p. 521, col. 2):—

"Whalley Taylor (1944), from experiments he had carried out at the Experimental Farm of the Poultry Association of Great Britain, suggested that the feeding of more than 10 per cent. of extracted palm kernel meal in a mash was a possible cause and that trichlorethylene as a solvent was more dangerous than benzine. We have been unable to confirm these results in our experiments.

"Professor Robertson, of the Animal Husbandry Department of the Royal (Dick) Veterinary College, analysed a large number of mashes where an unduly high mortality resulted and where a specific cause was not evident, in *post-mortem* examinations carried out here. In some cases a high percentage of fibre was present and it may be that this was a possible cause of loss in these specific instances, but in the majority of samples no great deviation from the usual composition was noted. Further work on this disease is proceeding and it is hoped to publish results shortly."

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## MEDICAL FILMS

Four interesting films dealing with modern surgery were exhibited at the Royal Society of Medicine on December 7th by the Scientific Film Association. In one the various stages that are necessary and the precautions to be observed in spinal anaesthesia were demonstrated. Another film, made in U.S.S.R., portrayed the removal of a piece of shrapnel from the heart of a wounded soldier. A third, also of Russian origin, which has been shown on a number of occasions in this country, explained the method worked out in U.S.S.R. whereby animals which have "died," *e.g.* by having the whole of their blood drained off from the carotid artery, can be restored to life through the reinjection of the blood by means of a piece of apparatus which simulates the action of the lungs and heart. The fourth film had been prepared by Sir James Barcroft, of Cambridge, and this demonstrated the effects of various stimuli, *e.g.* percussion, on the foetus of the sheep at various stages of its development.

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## FOOT-AND-MOUTH DISEASE: SWILL CONTROL

Stricter enforcement of the existing swill regulations is (says the *Farmers' Weekly*) proposed by the majority of the 32 N.F.U. county committees who have replied to headquarters' request for advice following the recent outbreaks of foot-and-mouth disease. In the interests of producers, the branches asked that where the purchasers of raw swill had suitable boiling plant and efficiently boiled the swill, they should be permitted to continue to do so. The Union, it is understood, have already asked the B.B.C. to give wider publicity to all outbreaks of the disease.

Discussing the views of the counties, the Union's Diseases of Animals Committee gave particular attention to the proposal put forward by several branches that all swill should go through processing plants. It was decided that such a step would not get over the difficulty where the pig-keeper used swill from his own household.

It was reported that 75 per cent. of recent outbreaks of the disease had occurred among pigs kept on butchers' and cottagers' premises. The committee decided that the best way to bring the legal responsibilities to the notice of such offenders was through the local press.

## FOOT-AND-MOUTH DISEASE IN LONDON

Foot-and-mouth disease has broken out in London. An outbreak was confirmed on Monday among pigs at Paddington. The area within which the movement of animals is restricted lies within the counties of London, Middlesex, Hertfordshire, Essex, Kent, Surrey and Buckinghamshire.

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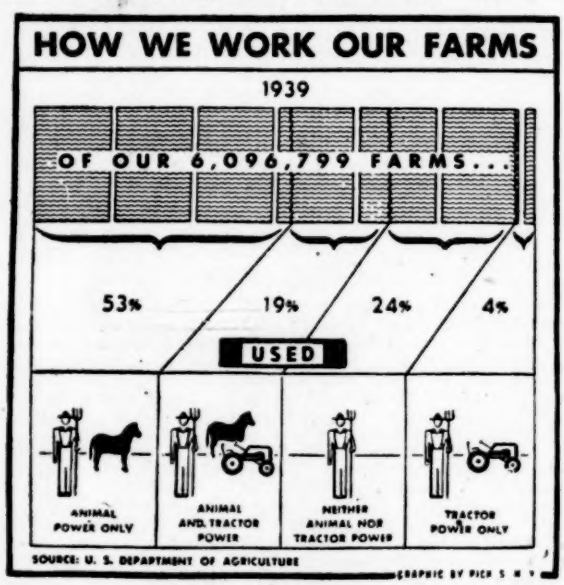
## THE ANIMAL-POWERED AMERICAN FARM

In its October issue the *Journal of the American V.M.A.* reproduces the chart which appears below, with the following text:—

The farmers of the United States are breaking production records that are heard and felt in the four corners of the world, even to the point of over-producing, and strangely, in the popular mind, all of the credit goes to the gas-pulled machinery, notwithstanding that 77 per cent. of American farms, as the chart shows, are as tractorless as a skating rink. The horse-tractor situation, broken down in the following chart, is portrayed from figures supplied by the United States Department of Agriculture, as of the year 1939. Although a survey for 1944 would no doubt change the percentage shown in the four columns, there is no certainty which way the columns would have changed on account of the war. Most assuredly, were the sizable war gardens and poultry projects included in the survey, the tractor column would lose ground to the animal and no-animal columns.

For the ten-year period, 1933 through 1942, the average livestock holding (cattle, hogs, sheep, fowl, *et al.*) was 132 million head. For 1943 the number was 171 million head.




Illustrating the role of the agricultural soliped in human affairs.
—*From the Chicago Sun.*

"The purpose of this piece is to retrieve confidence in the agricultural horse and mule which we ourselves may have lost through the continuous flow of misleading information on the make up of the nation's food-producing mechanism."

# CORRESPONDENCE

*The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.*

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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## CLINICAL INSPECTIONS

Sir,—From time to time in veterinary and other scientific literature the value of routine clinical inspections is criticised. Clinical inspections, as such, should not be condemned because of the fact that in flying herds infection can be so easily introduced immediately after an inspection has been made. Loose statements, sometimes made by members of our sister profession, frequently go unchallenged, and I am glad, therefore, of the opportunity of supporting the contention of Mr. A. B. Kerr, made in the *Record* of December 9th, 1944, that clinical inspections have a definite value in the eradication of udder tuberculosis. The inspections must, of course, be carefully carried out and there must be no reluctance about taking milk samples. I was concerned in the investigation of a similar outbreak to that mentioned by Kerr. Two individual samples of milk were taken and in each case the respective cow was subsequently removed under the Tuberculosis Order. In areas where mainly flying herds predominate the routine examinations must be carried out frequently. In my experience, if this is done, a fall in the positive bulk milks in the area will ensue.

I know that Mr. Kerr has the support of many of his colleagues in modestly suggesting that clinical examinations do little if anything to reduce the incidence of tuberculosis. It is a line of reasoning which I have never quite been able to follow, and as I had the temerity to suggest at a conference some years ago, frequent systematic clinicals with the removal of numerous open cases must reduce the incidence. It seems common sense to me to presume that the earlier and oftener open cases can be removed the less gross infection there will be about.

While on the subject of clinical inspections I would like to mention what appear to be encroachments on veterinary practice which have been brought to my notice. One is the taking of an individual sample of milk by a sanitary inspector following a reported case of tuberculosis in a calf at an abattoir, and the other the taking of an individual sample by a milk sampling officer in order presumably, to make a diagnosis of mastitis. If these practises are general they may be worthy of the consideration of the committee now studying the question of unqualified practice.

Yours faithfully,

2/4, Clifton Lodge, Winchester. F. H. Manley.
*December 16th*, 1944.

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## INJECTION OF LIVE ABORTION VACCINE

Sir,—Now that the live *Bac. abortus* is being distributed to members of the profession, I venture to think a warning here would not be out of place.

In the course of carrying out the injections the practitioner may have the misfortune to puncture his finger with the needle contaminated with the live germs. If such an accident should happen he should "play for safety" by sucking the puncture, taking the precaution to gargle afterwards with an antiseptic, and apply Beer's treatment to the finger; or he may have a wound on his hand which should be cauterised; or the syringe may break in his hand and the broken glass may abrade the skin, as has happened to me several times owing to the shoddy material these syringes are made of these days.

I have seen quite a few cases of undulant fever in humans where some have been diagnosed, but many more have been treated and diagnosed as rheumatism. Undulant fever is more common in this country than the medical faculty realises.

Yours faithfully,

Fryern Hall, Bridgwater. W. M. Scott.

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## VETERINARY ASSISTANTS

Sir,—We have recently seen letters in *The Veterinary Record* expressing some apprehension about the conditions of employment of veterinary assistants in the future.

I suggest that we veterinary surgeons who are now employed as assistants form an "Association of Veterinary Assistants" to safeguard our interests as regards salary, etc.—the Association to have membership and a Council.

Before making further suggestion as to the nature of the Association and means as to its initiation I would like to hear the opinion of other assistants on the matter, either by letters in *The Veterinary Record* or by private communication.

Yours faithfully,

4, Church Street, Llangefni, Anglesey. T. Hughes-Ellis.
*December 27th*, 1944.

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## "A NOBLE CALLING"

Sir,—I should like through your columns to compliment and congratulate Dr. Tom Hare on his learned and inspiring address to the Central Veterinary Society as published in your issue of December 9th. I commend it especially to the younger generation and to our students.

What a blessing if our members were imbued more with the higher ideals of the profession. The great Ruskin said ours is a noble calling, "attending to the wants of those who cannot even thank."

Yours faithfully,

Cushnahouna, Ennis, Co. Clare. P. J. Howard.
*December 13th*, 1944.